## WORKSHEET for Evidence-Based Review of Science for Emergency Cardiac Care

**Worksheet author(s)**  
Anthony J Handley MD FRCP  

**Date Submitted for review:** 16 December 2009

### Clinical question.

For BLS providers (lay or HCP) (P), does a longer-duration instructor-based course (I), compared with a shorter-duration instructor-based course (C), improve skill acquisition and retention (O)?

### Is this question addressing an intervention/therapy, prognosis or diagnosis?  
**Educational intervention**

### State if this is a proposed new topic or revision of existing worksheet:  
New topic

### Conflict of interest specific to this question

Do any of the authors listed above have conflict of interest disclosures relevant to this worksheet? No

### Search strategy (including electronic databases searched).

- Medline (+ Scopus)
- Embase
- Follow-up references
- Cited-by references (Scopus)

(Basic life support OR cardiopulmonary resuscitation) AND training  
(Basic life support OR cardiopulmonary resuscitation) AND (training AND duration)  
Cardiopulmonary resuscitation AND education  
Cardiopulmonary resuscitation AND (education AND duration)

**Updated search 13 September 2009 (1 year since original search)**

Search terms as above re-run on Medline, Embase, Scopus (for citations)

#### • State inclusion and exclusion criteria

- **Included:** Comparison of duration of instructor-led BLS courses
- **Excluded:** Non-human (theoretical); advanced life support; AED only; abstract only; not peer reviewed

#### • Number of articles/sources meeting criteria for further review:

- 273 studies met criteria; 11 reviewed; 8 rejected (not direct comparison of course duration); 3 papers relevant
- Cited-by references (Scopus) – none additional found
- **Updated search 13 September 2009:** No additional relevant papers found
## Summary of evidence

### Evidence Supporting Clinical Question

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<thead>
<tr>
<th>Level of evidence</th>
<th>Evidence Supporting Clinical Question</th>
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<tbody>
<tr>
<td>Good</td>
<td>Andresen 2008, 419 E</td>
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<tr>
<td>Fair</td>
<td>Gombeski 1982, 849 E</td>
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<td>Yakel 1989, 520 E</td>
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**Level of evidence**

- **A** = Return of spontaneous circulation
- **B** = Survival of event
- **C** = Survival to hospital discharge
- **D** = Intact neurological survival
- **E** = Other endpoint
- *Italics = Animal studies*
### Evidence Neutral to Clinical Question

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### Evidence Opposing Clinical Question

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- **A** = Return of spontaneous circulation
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- **E** = Other endpoint

*Italic* = Animal studies
A single, manikin, study (LOE 1 (manikin): Andresen 2008, 419) was found that compared BLS skill acquisition after different duration instructor-based courses. Lay volunteers were group-randomised to receive a course of 2-, 4-, or 7-hours duration. These courses included AED training but BLS skills were assessed separately. Those receiving a 7-hour course performed better in most BLS skills tested immediately after the course. Testing was also carried out 6 and/or 12 months after the course: skills had deteriorated in all 3 groups by 6 months but the 7-hour course group retained an advantage. There was no further deterioration in skills in any group by 12 months. The absolute difference in skills levels between the groups was, however, judged ‘inconsequential’. Receiving a refresher course at 6 months resulted in a 2-hour course being clinically equivalent to a 7-hour course.

Two manikin studies were found that compared BLS skill retention, but not acquisition. One study (LOE 2 (manikin): Yakel 1989, 520) tested nurses 4 months and 8 months after BLS courses of 30-45 minutes or 6-8 hours; in the second study (LOE 2 (manikin): Gombeski 1982, 849) laypeople were tested 1 year after BLS courses of 4 hours or 8 hours. Both studies showed significant benefit for the longer courses, but are flawed by several differences in the courses other than just duration.

Acknowledgements:

Citation List


Level 1 (manikin). Good. Supporting.
Lay volunteers group-randomised to 2-, 4-, or 7-hour BLS and AED course. Immediate post-training skills significantly better for 7-hour course group. Skill deterioration by 6 months for all three groups; 7-hour group maintained advantage but not considered clinically significant.


Level 2 (manikin). Fair. Supporting.
Laypeople randomised to 8-hour or 4-hour training BLS course. Significantly better skill retention at 1 year for those receiving longer course.


Level 2 (manikin). Fair. Supporting.
Nurses randomised to 30-45 minute (with prior reading) or 6-8 hour BLS course. Significantly better skill retention at 4 months and 8 months for those receiving longer course.